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Case Report

Myxoid dermatofibroma on a great toe: a case report

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Abstract: Dermatofibroma is a common benign fibrohistiocytic tumor with many clinicopathological variants. Myxoid dermatofibroma is one of these variants, which is characterized by marked stromal mucin deposition. This report presents a case of myxoid dermatofibroma on a great toe that had been slowly growing for two years. Histopathologically, the relatively well-circumscribed dermal tumor was separated from the epidermis by a small grenz zone. The tumor tissue consisted of oval to spindle-shaped cells with well-defined cell borders and spindly condensed nuclei. No cytologic atypia or mitotic figures were found. Although most of the tumor cells were embedded in a prominently myxoid stroma, typical features of classic dermatofibroma including a storiform growth pattern and more densely packed collagen were observed at the periphery. Immunohistochemically, the tumor cells showed positive staining for CD68 and CD99, and negative staining for CD34 and S-100. Histopathological differential diagnoses of myxoid dermatofibroma include soft tissue neoplasms with myxoid tumor stroma, such as superficial acral fibromyxoma, cellular digital fibroma, superficial angiomyxoma, myxoid dermatofibrosarcoma protuberans and low-grade fibromyxoid sarcoma. Immunohistochemical staining can be useful in the differential diagnosis of these tumors. This case highlights the challenges encountered in the histopathological interpretation of myxoid dermatofibroma. Pathologists should keep in mind the diagnosis of myxoid dermatofibroma when dealing with myxoid neoplastic lesions arising on acral sites.

Keywords: Dermatofibroma, myxoid variant, superficial acral fibromyxoma, immunohistochemistry

Introduction

Dermatofibroma is a common benign fibrohistiocytic tumor of unknown etiology [1]. Due to varied histopathological aspects, synonymous designations include benign fibrous histiocytoma, histiocytoma cutis, nodular subepidermal fibrosis and fibrous xanthoma [2]. Over the last three decades numerous distinctive clinicopathological variants have been described. Myxoid dermatofibroma is a very rare variant of dermatofibroma, which is characterized by marked stromal mucin deposition. Only 12 cases of myxoid dermatofibroma have been reported in the literature [1-3]. We present a case of myxoid dermatofibroma arising on a great toe. This is an unusual site for such a rare lesion. Although any surface of the skin may be affected, dermatofibromas are most common on the lower extremities [4]. Presentation of dermatofibroma on the digits is not commonly reported in the literature [5, 6]. We describe the clinicopathological findings of digital myxoid dermatofibroma and also discuss the immunohistochemical staining results.

Case presentation

A 46-year-old Korean woman, with no relevant medical history, presented with a 2-year history of a slowly enlarging subungual mass on the right great toe. The lesion was asymptomatic, even though she professed tenderness when the mass was pressed and complained that it was impossible to wear shoes. She denied any history of antecedent trauma. Physical examination revealed a firm, round hyperkeratotic mass of 15 mm in diameter, which distorted the whole nail plate. Roentgenographic examination did not reveal any bony alteration. An initial

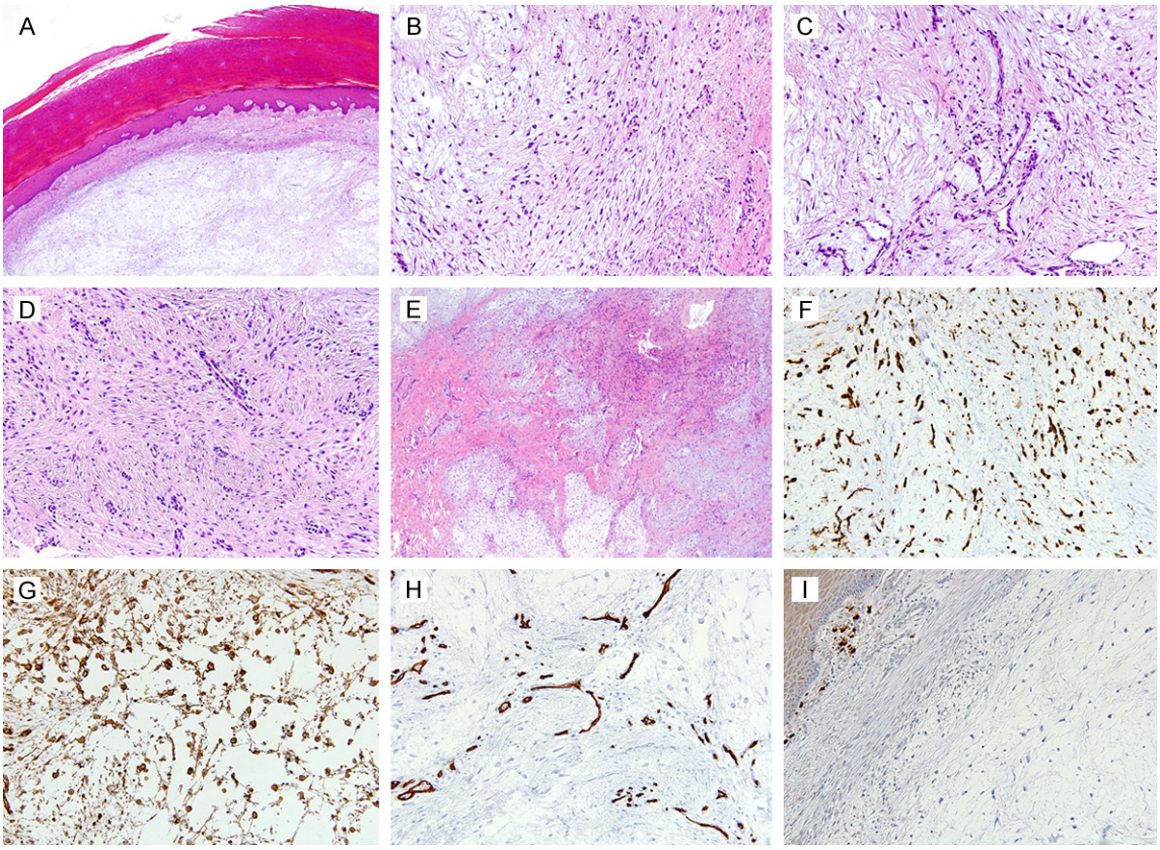

Figure 1. Histopathological and immunohistochemical findings. A. A relatively well-circumscribed, unencapsulated cutaneous tumor was observed, with a small grenz zone towards the epidermis. B. Higher magnifications showed a moderately dense infiltrate of ovoid to spindle-shaped cells. C. The tumor cells were embedded in a prominently myxoid, well to moderately vascularized stroma. D. Some areas of the periphery exhibited typical features of classic dermatofibroma including a storiform growth pattern. E. Alternating areas of fibrotic and myxoid stroma were also observed. Immunohistochemically, the tumor cells expressed strong reactivity for F. CD68 and G. CD99, whereas they were negative for H. CD34 and I. S-100. CD34, which highlights the vascular endothelial cells, serves as internal positive control.

clinical diagnosis of digital wart was considered. Complete routine laboratory examinations including hematological and biochemical tests revealed no abnormalities. A complete surgical excision of the distal phalanx was performed.

Pathologic findings

Histopathological examination of the excised specimen revealed a relatively well-circumscribed dermal lesion with a small grenz zone towards the epidermis (**Figure 1A**). The cutaneous tumor extended to the subcutaneous tissue but did not invade the bony trabeculae. Higher magnifications showed a mildly to moderately dense infiltrate of ovoid to spindle-shaped cells similar in size to ordinary fibrocytes (**Figure 1B**). These cells had well-defined cell borders with spindly condensed nuclei. There was no cytologic atypia, and mitotic figures were not found. Most of the tumor cells were embedded in a prominently myxoid, well to moderately vascularized stroma (**Figure 1C**). A vascular network consisting of elongated capillaries with narrow lumina was seen, but no erythrocyte extravasation was found. Occasional lymphocytes and plasma cells were interspersed within the stroma. At the periphery these changes gradually faded with typical features of classic dermatofibroma, including a storiform growth pattern (**Figure 1D**) and more densely packed, focally sclerotic collagen. In some areas, there were alternating fibrotic areas with myxoid stroma (**Figure 1E**). Immunohistochemical staining revealed strong reactivity of tumor cells for CD68 (**Figure 1F**) and CD99 (**Figure 1G**), whereas they were neg-

ative for CD34 (**Figure 1H**) and S-100 (**Figure 1I**). A 9-month follow-up examination showed no evidence of tumor recurrence or metastatic disease.

Discussion

Dermatofibroma is a reactive hyperplastic response of the skin of unknown etiology, which is mostly seen on the extremities of young or middle-aged women [2, 3]. A wide variety of clinicopathological variants of dermatofibromas has been described over the last decade, including fibrocollagenous, vascular, angiomatoid, sclerosing, palisading, epithelioid, atypical, clear cell, myofibroblastic and cellular types. Myxoid dermatofibroma is very rare, accounting for only 0.4% of all dermatofibromas [2]. This frequency is similar to other rare variants, such as palisading, clear cell or myofibroblastic types. Mucinous material is a unspecific finding [7], which can be found in a variety of benign and malignant lesions [2]. It is uncommon for dermatofibroma to contain abundant myxoid matrix, but one should consider its myxoid variant if myxoid areas interface with better-developed storiform architecture.

Unawareness of this feature may cause misinterpretations, most likely as other cutaneous myxoid tumors. This happens in particular when attention is not paid to peripheral portions. It can be difficult to consider the possibility of dermatofibroma if one merely examines the central portions showing myxoid stroma. Histopathological differential diagnoses include several soft tissue neoplasms showing myxoid matrix, such as superficial acral fibromyxoma, cellular digital fibroma, superficial angiomyxoma, cellular myxoma of soft tissue, myxoid neurofibroma, myxoid dermatofibrosarcoma protuberans and low-grade fibromyxoid sarcoma. The most important entity in the histopathological differential diagnosis of the present case was superficial acral fibromyxoma. The tumor location preferred superficial acral fibromyxoma to myxoid dermatofibroma. Furthermore, from a histologic standpoint, the tumor contained fibroblast-like cells embedded in a myxoid or myxocollagenous matrix with moderately accentuated vasculature, suggesting the diagnosis of superficial acral fibromyxoma. However, superficial acral fibromyxoma is more myxoid compared with myxoid dermatofibroma, and does not have alternating zones of fibrotic and myxoid stroma. Most importantly, whereas superficial acral fibromyxoma commonly express CD34, this antigen is rarely found in dermatofibroma [2, 8]. Even though there may occasionally be an increase of CD34 expression at the periphery of the lesion, which derives from the intrinsic reactivity of the surrounding stromal tissue response, this finding is in sharp contrast to superficial acral fibromyxoma and dermatofibrosarcoma protuberans, which are usually diffusely and strongly positive for CD34. The fibrohistiocytic origin of myxoid dermatofibroma is indicated by several characteristics shared with classic dermatofibromas: predilection for the lower legs of young to adult women, preservation of storiform pattern in the periphery, immunoreactivity for histiocytic marker CD68 and a benign clinical course with no recurrence. CD68-positive/CD34-negative immunophenotype, together with the presence of histopathologic features of classic dermatofibroma, is useful in the differential diagnosis.

Cellular digital fibroma is a benign tumor that usually develops in the fingers and toes. This tumor is superficially located and consists of monomorphic spindle cells arranged in a storiform pattern and immersed in a stroma with abundant collagen. Unlike myxoid dermatofibroma, cellular digital fibromas display a lower degree of vascularization in comparison with myxoid dermatofibroma, and the stroma is more fibrotic than myxoid [9, 10]. Immunohistochemically, the spindle cells of cellular digital fibroma strongly express CD34, but are usually negative for CD99. Superficial angiomyxoma is most common in the head, neck and trunk, and is exceedingly rare in acral sites. They display multilobulated appearance and a prominent vascular component with a neutrophilic infiltrate scattered within the lesion. The tumor cells of superficial angiomyxoma also express CD34, and immunostaining for CD99 is characteristically negative. Cellular myxoma of soft tissue is a CD34-positive subcutaneous soft tissue tumor, developing most times within a muscle, rarely occurring on hands or feet [11]. Myxoid neurofibroma should be also considered in the histopathological differential diagnosis. This variant of neurofibroma reveals consistent immunoreactivity for S-100 and does

not show the increased vasculature of myxoid dermatofibroma. Myxoid dermatofibrosarcoma protuberans is exceedingly uncommon, and as other variants of dermatofibrosarcoma protuberans, almost never occurs on the fingers and toes. It shows areas of classic dermatofibrosarcoma protuberans when the neoplasm is adequately excised; the spindle cells are arranged in a storiform pattern and extends into the subcutaneous with a typical honeycomb pattern, and paucicellular myxoid areas are surrounded by more typical areas. Furthermore, myxoid dermatofibrosarcoma protuberans is immunoreactive for CD34. Low-grade fibromyxoid sarcoma is a deep soft tissue tumor that only exceptionally arises on the fingers or toes. Although it can display alternating fibrous and myxoid areas, it is characterized by homogeneous whirling growth of spindle cells in heavily collagenized stroma and abrupt transition from fibrous to myxoid areas.

We observed CD99 immunoreactivity in the tumor cells of myxoid dermatofibroma. Data on CD99 staining in dermatofibromas are limited, with only a few random reports available in the literature that show mixed results. Dermatofibroma reportedly does not does not express CD99 [12, 13], although in a recent study, diffuse and strong CD99 immunoreactivity CD99 was detected in all dermatofibromas examined [14]. Tumors of fibrohistiocytic origin have been reported to show CD99 positivity [14]. Role of CD99 immunostaining in the differential diagnosis of dermatofibroma remains controversial.

In summary, we describe a case of myxoid variant of dermatofibroma on a great toe, a location not hitherto described in the literature. Because of its rarity, myxoid dermatofibroma may be confused with other myxoid lesions. A thorough examination for the presence of typical features of classic dermatofibroma and immunohistochemical staining are helpful in the differential diagnosis.

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Disclosure of conflict of interest

None.

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References

[1] Calikoglu E, Chavaz P, Saurat JH and Kaya G. Decreased CD44 expression and stromal hyaluronate accumulation in myxoid dermatofibroma. Dermatology 2003; 207: 104-106.

[2] Zelger BG, Calonje E and Zelger B. Myxoid dermatofibroma. Histopathology 1999; 34: 357-364.

[3] Yamamoto T, Yokoyama A, Katayama I and Nishioka K. Dermatofibroma with myxoid changes in a patient with psoriasis. J Dermatol 1995; 22: 780-783.

[4] Gonzalez S and Duarte I. Benign fibrous histiocytoma of the skin. A morphologic study of 290 cases. Pathol Res Pract 1982; 174: 379-391.

[5] Schwob VS and Santa Cruz DJ. Palisading cutaneous fibrous histiocytoma. J Cutan Pathol 1986; 13: 403-407.

[6] Yamamoto T, Umeda T and Nishioka K. Dermatofibroma of the digit: report of six cases. Dermatology 2003; 207: 79-81.

[7] Mackenzie DH. The myxoid tumors of somatic soft tissues. Am J Surg Pathol 1981; 5: 443-458.

[8] Weiss SW and Nickoloff BJ. CD-34 is expressed by a distinctive cell population in peripheral nerve, nerve sheath tumors, and related lesions. Am J Surg Pathol 1993; 17: 1039-1045.

[9] Guitart J, Ramirez J and Laskin WB. Cellular digital fibromas: what about superficial acral fibromyxoma? J Cutan Pathol 2006; 33: 762-763; author reply 764.

[10] McNiff JM, Subtil A, Cowper SE, Lazova R and Glusac EJ. Cellular digital fibromas: distinctive CD34-positive lesions that may mimic dermatofibrosarcoma protuberans. J Cutan Pathol 2005; 32: 413-418.

[11] van Roggen JF, McMenamin ME and Fletcher CD. Cellular myxoma of soft tissue: a clinicopathological study of 38 cases confirming indolent clinical behaviour. Histopathology 2001; 39: 287-297.

[12] Andre J, Theunis A, Richert B and de Saint-Aubain N. Superficial acral fibromyxoma: clinical and pathological features. Am J Dermatopathol 2004; 26: 472-474.

[13] Carranza C, Molina-Ruiz AM, Perez de la Fuente T, Kutzner H, Requena L and Santonja C. Subungual acral fibromyxoma involving the bone: a mimicker of malignancy. Am J Dermatopathol 2015; 37: 555-9.

[14] Kazlouskaya V, Malhotra S, Kabigting FD, Lal K and Elston DM. CD99 expression in dermatofibrosarcoma protuberans and dermatofibroma. Am J Dermatopathol 2014; 36: 392-396.